

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Rec'd PCT 02 FEB 2005	
REC'D 04 JAN 2005	
WIPO	PCT

Applicant's or agent's file reference JP802499/142	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. <b>PCT/NZ2003/000169</b>	International Filing Date (day/month/year) 1 August 2003	Priority Date (day/month/year) 2 August 2002
International Patent Classification (IPC) or national classification and IPC <b>Int. Cl.<sup>7</sup> C09K 17/02; C05G 3/08</b>		
Applicant <b>LINCOLN UNIVERSITY et al</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheet(s).

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 9 February 2004	Date of completion of the report 16 November 2004
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>L.F. McCAFFERY</b> Telephone No. (02) 6283 2573

**I. Basis of the report****1. With regard to the elements of the international application:\***

- ☒ the international application as originally filed.
- ☐ the description, pages , as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the claims, pages , as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the drawings, pages , as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

**4. ☐ The amendments have resulted in the cancellation of:**

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be nonobvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos: **1 to 35 (all in part)**

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. **1 to 35** are so unclear that no meaningful opinion could be formed (*specify*):

As noted in the ISR, the invention resides in the reduction of nitrification products (nitrate, nitrous oxide, leached nutrients) by the treatment of grazed pasture with a nitrification inhibitor. These products are an intrinsic feature of any treatment of this type, and therefore a complete search could not be carried out. The search has been largely restricted to treatments specifically noting these outcomes and involving animal urine. As presently drafted the claim does not necessarily involve nitrification resulting from the excessive nitrogen loading that is a consequence of animal urination.

It is further noted that the delivery mechanisms of Claims 12 to 17 are essentially known, for example a boom spray or fertiliser spreader would fall within the scope of these claims. Accordingly the search has been limited to such mechanisms when used for the methods searched above

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claim Nos. **1 to 35 (in part)**

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims 1 to 35	YES
	Claims	NO
Inventive step (IS)	Claims 1 to 35	YES
	Claims	NO
Industrial applicability (IA)	Claims 1 to 35	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**

The following documents are referred to in this report:

D1 WO 2002/019809

D2 J. C. WILLIAMSON et al., Agriculture, Ecosystems & Environment (1998), 69(1), 81-88.

D3 R. B. THOMPSON, Soil Biology & Biochemistry (1989), 21(7), pp. 875-882.

D4 STN FILE CABA 2002:2157 & N. AKAI et al., Japanese Journal of Soil Science and Plant Nutrition, (2001), Vol. 72, No. 2, pp. 206-213.

D5 A. P. WHITMORE, "Impact of Livestock on Soil", Virtual Conference [online], retrieved from Internet at <http://agriculture.de/acms1/conf6/ws4lives.htm>

D6 H. WOZNIAK et al., "Nitrification Inhibitors for Economically Efficient and Environmentally Friendly Nitrogen Fertilization," IFA Agricultural Conference on Managing Plant Nutrition, 29 June-2 July 1999, Barcelona, Spain.

D7 W. R. COOKSON et al., Soil Biology & Biochemistry (2002), 34(10), pp. 1461-1465.

D8 H. J. DI et al., Soil Use and Management, (2002) Vol. 18, No. 4, pp 395-403.

The priority claim of the present application is considered to be valid, and as a consequence citations D7 and D8 are not considered relevant for the purpose of determining novelty and inventive step.

Present claim 1 defines a "tool" (taken to be a method) wherein nitrification is reduced in grazed pastures by treatment of the pasture with a nitrification inhibitor. Treatment may be with a solution, suspension or crystalline form of the nitrification inhibitor. In my opinion, the problem to be solved lies in reducing the effect of nitrification due to excess nitrogen loading in animal urine patches. These are the major source of nitrate leaching in such agricultural systems. The applicants have noted that these account for over 80% of the nitrate leached from soils. The applicant also noted that treatment of the soil with fertilisers coated, or combined with nitrification inhibitors was not sufficient to reduce nitrification since these did not provide adequate coverage. The present invention was said to reside in treating "the whole area of the grazed pasture soil using a solution or fine particle suspension of the nitrification inhibitor thus ensuring that actual surface area coverage is close to 100%." I note that the claims are not limited to solutions or fine particle suspensions, but include crystalline forms which presumably would be similar to treatment with the combinations of fertiliser and inhibitor described in the prior art and which the applicant has sought to distinguish from the present invention.

Continued.

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The claims are not supported by the description. The applicant has submitted that the invention lies in the use of solutions or suspensions containing nitrification inhibitors that achieve almost 100% coverage of the soil. The claims are not limited to such, and include crystalline inhibitors. The submissions suggest such compositions would not meet the desired coverage requirements. Furthermore the invention resides in reducing the effects of nitrification due to excess nitrogen loading in grazed pastures due to urine patches. The claims do not clearly define this feature.

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

**Continuation of V.2**

Accordingly the present report is only based on the invention comprising a method of treating grazed pasture to reduce the effects of nitrification that are the result of excess nitrogen loading due to animal urine patches, said method comprising the treatment of the whole grazed area with a nitrification inhibitor in a form that provides essentially 100% coverage of the soil. This interpretation is not necessarily reflected in the present claims.

D1 discloses a device that permits the release of nitrification together with the urine of the animal. This does not anticipate the present claims. However in the discussion of the prior art and the problem to be solved, the citation indicates that a feasible means of treating pastures would be to spread a nitrification inhibitor on the pasture. This is said to be impractical or not economical on a large scale. In response the applicant has noted that this citation does not enable the present method wherein the entire area is treated to obtain almost 100% coverage of the soil. In view of these comments novelty and inventive step is acknowledged.

None of D2 to D6 discloses a method of reducing the effects of nitrification in grazed soils due to urine patches according to the present method which comprises treating the whole grazed area in such a manner as to approach 100% coverage of the soil. Novelty and inventive step can be acknowledged.

The claims are considered industrially applicable in view of the purported use of the method.